

WHAT IS CLAIMED IS:

1 1. An imaging device comprising:
2 a plurality of active pixel sensor cells, each
3 having a photosensor, a row select transistor, and an output
4 transistor including a gate connected to a pixel output
5 voltage; and

6 a readout circuit connectable to each of said APS
7 cells, said readout circuit including an amplifier, said
8 amplifier including the row select transistor and the output
9 transistor of each of a plurality of said active pixel sensor
10 cells.

1 2. The imaging device of claim 1, wherein the amplifier
2 provides a gain of about one or higher.

1 3. The imaging device of claim 1, wherein the amplifier
2 comprises:

3 a first branch comprising:

4 a first transistor having a drain connected to

5 a first voltage source;

6 the row select transistor of each pixel; and

7 the output transistor of each pixel;

8 a second branch comprising:

9 a second transistor having a drain connected to
10 the first voltage source;

11 a third transistor having a gate connected to a
12 second voltage source; and

13 a source follower transistor having a drain
14 connected to a source of each of the third
15 transistor and the output transistor of each pixel.

1 4. The imaging device of claim 3, wherein the first
2 voltage source comprises V_{DD} .

1 5. The imaging device of claim 3, wherein each of the
2 first and second transistors comprise a p-type transistor and
3 each of the row select transistors, output transistors, third
4 transistor, and source follower transistor comprise an n-type
5 transistor.

1 6. The imaging device of claim 3, further comprising a
2 fourth transistor connected between the third transistor and
3 the source follower transistor, said fourth transistor
4 comprising a gate connected to the first voltage source.

1 7. The imaging device of claim 3, wherein each pixel
2 and the amplifier are connected to a column line, and further

3 comprising a switch in each pixel to shield the output
4 transistor from voltage changes in the column line.

1 8. The imaging device of claim 7, wherein the switch
2 comprises a blocking transistor connected between a drain of
3 the output transistor and the first transistor, said blocking
4 transistor having a gate connected to a gate of the row select
5 transistor.

1 9. The imaging device of claim 1, further comprising a
2 gain selector to enable a change in gain in the amplifier.

1 10. The imaging device of claim 3, further comprising a
2 gain selector to enable a change in gain in the amplifier,
3 said gain selector comprising:

4 a first gain transistor having a drain connected to the
5 first voltage source; and

6 a first gain-enable transistor connected between a source
7 of the gain transistor and the source of the first transistor,

8 wherein while the first gain-enable transistor is
9 conducting, the first transistor and the first gain transistor
10 are connected in parallel.

1 11. The imaging device of claim 10, wherein the gain
2 selector further comprises:

3 a second gain transistor having a drain connected to the
4 first voltage source; and

5 a second gain-enable transistor connected between a
6 source of the second gain transistor and the source of the
7 second transistor,

8 wherein while the second gain-enable transistor is
9 conducting, the second transistor and the second gain
10 transistor are connected in parallel.

1 12. The imaging device of claim 10, wherein each of the
2 first gain transistor and the first gain enable transistor is
3 p-type transistor.

1 13. An imaging device comprising:
2 a plurality of active pixel sensor cells, each
3 having a photosensor, a row select transistor, and an output
4 transistor including a gate connected to a pixel output
5 voltage; and

6 a readout circuit connectable to each of said APS
7 cells, said readout circuit including an amplifier, said
8 amplifier comprising:

9 a first branch comprising:

10 a first transistor having a drain connected to
11 a first voltage source;

12 the row select transistor of each pixel; and

13 the output transistor of each pixel;
14 a second branch comprising:
15 a second transistor having a drain connected to
16 the first voltage source;
17 a third transistor having a gate connected to a
18 second voltage source;
19 a fourth transistor; and
20 a source follower transistor having a drain
21 connected to a source of each of the fourth
22 transistor and the output transistor of each pixel.

1 14. The imaging device of claim 13, wherein the
2 amplifier provides a gain of about one or higher.

1 15. The imaging device of claim 3, wherein the first
2 voltage source comprises V_{DD} .

1 16. The imaging device of claim 13, wherein each of said
2 transistors comprise a MOSFET.

1 17. The imaging device of claim 3, wherein each of the
2 first and second transistors comprise a p-type transistor and
3 each of the row select transistors, output transistors, third
4 transistor, fourth transistor, and source follower transistor
5 comprise an n-type transistor.